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attached is a copy of Norman Aralejo
testimony to the Senate Armed Services
Committee on 7 Mar 84. It is appearing in the
June 84 issue of the APA's Polygraph.
Pat Mead thought we should have it.

Sick

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STATEMENT OF NORMAN ANSLEY, CHIEF, POLYGRAPH DIVISION,
OFFICE OF SECURITY, NATIONAL SECURITY AGENCY BEFORE
THE ARMED SERVICES COMMITTEE, U.S. SENATE, MARCH 7, 1984

Mr. Chairman, I appreciate the opportunity to appear before the Committee today to explain the polygraph program at the National Security Agency.

NSA, and its predecessor agency, has used the polygraph as a personnel security screening technique since 1951. Originally it was used as an emergency measure to expedite the security processing of new employees who were awaiting clearance. In 1953, the polygraph examination became a condition of access for all civilian job applicants. Since the 1950s a polygraph examination has also been a requirement for contractor personnel requiring sensitive compartmented information (SCI) access. We also polygraph other affiliates such as GSA custodial personnel, Federal Protective Service Police and consultants. In late 1982 we initiated a program to polygraph Military assignees once they are on-board at NSA. I will say more about this later.

The function of the polygraph is threefold:

First, to assist in verifying the identity of an individual being considered for access to SCI. Secondly, to assist in focusing upon suitability and counterintelligence issues, though I must add that from my point of view all our polygraph questions and programs are concerned with counterintelligence. Third, to detect espionage, sabotage and terrorism or the potential for same.

We have three basic polygraph programs at NSA which are integral to our overall personnel security supervision program. This program includes background and special investigation, professional security officers assigned to major agency organizations and an aggressive security awareness program.

The first polygraph program is for initial access to sensitive information. Here we conduct full screening polygraph examinations of applicants for employment, contractor applicants for access, GSA personnel and a few other categories of affiliates. The full screening polygraph examination consists of relevant life style and counterintelligence questions. A second program is for single or special issues. Here we use the polygraph to help resolve issues bearing on the continued access of an affiliate - for example to resolve allegations of drug use or possible espionage by an affiliate.

We have had these two programs for more than 30 years.

Our third program is the aperiodic and reinvestigation polygraph. In August 1982 Deputy Secretary of Defense Carlucci, acting on recommendation from the DoD Select Panel on Personnel Security, authorized polygraph examinations of DoD affiliates who held sensitive compartmented information access. The Director directed this program be implemented at NSA. Since then we have been polygraphing on-board affiliates, persons having access to sensitive NSA information: employees, contractor personnel, and

Military assignees. The program applies to everyone. It is mandatory. The scope of this polygraph program is limited strictly to counterintelligence questions: Espionage, sabotage, unauthorized disclosure of classified information, unauthorized contact with agents of foreign governments and knowledge of others involved in the foregoing. For our purposes today I will call this the aperiodic polygraph program though in fact we polygraph our affiliates under this program under several criteria:

- . Randomly, aperiodically
- . At the time of the five year reinvestigation
- . For especially sensitive projects

Some statistics on this newest NSA polygraph (and I must add here that in years past we have had versions of this program but lacking the mandatory feature) are quite interesting. During the last ten months of 1983 we polygraphed 1770 affiliates under the aperiodic program. Of these 1699 showed no specific reactions to the relevant polygraph questions. Of the 71 who continued to show reactions, 67 were cleared up in a second polygraph examination and the remaining four in a third examination. Thus, of 1770 cases we have zero cases where we have unresolved issues based on our analysis of the polygraph charts. Some 30 of these 1770 people did provide us relevant information requiring a more detailed clearance evaluation. None of these 30 are spies. The information they provided is quite miscellaneous - I will give you three examples.

- . An individual said that he kept a classified military manual in his possession at his residence for several years. He originally took the manual home to study for a test. He returned the manual to us.

- . An individual knew of improper destruction of crypto keying material. However, he was not personally involved.

- . Another individual described a suspicious approach by foreign personnel and had failed to report this incident previously. This information is under investigation.

The aperiodic program has been well received by our affiliates. No one has refused to take the polygraph examination. And, so important for research and validity purposes, we have no cases in these 1770 where a person is under a cloud because of polygraph chart analysis. All cases have been resolved - no one stands accused.

Now I'll describe the overall scope and impact of our polygraph activities. In 1983 we conducted a total of 10,712 polygraph examinations in all the programs I've described. During 1983 we completed the security processing of 4531 applicants. We cancelled out 2563 or more than 50 percent for a variety of reasons including the applicant declining to participate in further applicant processing or declining a job offer. NSA's applicant review panel composed of personnel, security and medical managers, looks at problem cases to decide if processing should proceed. The problem may be medical, psychological, security, or employability. This panel rejected 815 people for further processing (included in the 1563 I mentioned above). I estimate that in 90 percent of the panel cases - or

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733 of the 815 - information obtained during the polygraph interview was relevant to the decision not to further process.

While the polygraph process is a significant collector of information in our applicant processing it is no less a factor in the clearance processing of contractor personnel. During 1983 we polygraphed 1946 contractor personnel. Two hundred and fifty-seven were denied access based on information developed during the polygraph interview.

The NSA Personnel Security Program is established in Public Law 88-290 and we adhere to the standards set by the DCI for access to sensitive information. Most disqualifying information disclosed during the full screening polygraph examination concerns extensive drug use or undetected crimes. While of course rare, we have had some extraordinary admissions made by applicants during the polygraph interview - murder and train wrecking for example. You will see examples of important information developed during our polygraph examinations in two studies being put before you - The DOD/NSA Study on The Accuracy and Utility of Polygraph Testing* and the DCI Security Committee summary of major polygraph cases in the intelligence community Polygraph Utility Study, February 1984.

Prior to Mr. Carlucci's August 1982 policy we did not routinely polygraph military assignees. This is on the verge of being fixed. Under the new, proposed DoD polygraph program military personnel are to be polygraphed (CI questions only) by their parent service prior to assignment to NSA. And, as I mentioned they are under the mandatory NSA aperiodic polygraph program. Since December 1982, 679 military personnel have been polygraphed at NSA under this program.

These then, are the polygraph programs. They are only as effective as the polygraph and those that use it can make it.

The current instruments used by federal agencies are the product of 85 years of development by scientists and practitioners. The physiological channels which they record are the product of lengthy research. The instruments, which are of scientific quality, record respiration, electrodermal responses, and cardiovascular responses. The physiological information is recorded on a moving chart which has a speed of 2 1/2 millimeters per second (about six inches per minute). In each polygraph examination, there are at least two polygraph charts of several minutes each. In more complex situations, there may be as many as six or seven charts. The minimum time for an interview, including a polygraph examination is about one hour, but it more often takes from one and one half to three hours, and occasionally longer than that.

In the pretest interview, the subject of the examination reads a full statement of his rights. In all cases that includes mention of the Fifth Amendment right to avoid self-incrimination, mention that the subject may refuse to answer any questions, and that the subject may terminate the interview at any time. In a criminal case the Miranda warning is included, or Article 31 of the Uniform Code of Military Justice. When the polygraph is used in determinations for clearance and access to classified

* Published in the March 1984 issue of Polygraph.

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information, we advise of the Privacy Act of 1974 which includes a discussion of the principal purposes for which the information will be used and mentions that the disclosure of the information is voluntary, and the information will be considered confidential. It warns the person that any information provided relating to violation of criminal laws will be disseminated to law enforcement agencies.

Following the explanation of the subject's rights, there is a review of the subject's general health, and fitness to take a polygraph examination. After that the examiner reviews the issues that are to be resolved during the polygraph examination which includes an opportunity for the subject to explain in detail their view of the matter under consideration. Working with the examiner, the subject and examiner arrive at mutually acceptable questions to resolve the issues. When the technique involves control questions, these questions are also reviewed in discussion with the subject and must be agreeable to the subject. This is also true of irrelevant questions and other questions that are part of the technique. The testing technique is then explained in detail to the subject. The attachments which are placed on the subject are also explained in detail. The subject is asked to sit still, pay attention to the questions and answer with a definite "yes" or "no", as appropriate.

Basically, the polygraph examination is a method of questioning whereby an individual is required to unequivocally respond with a yes or no answer to direct questions which have been previously reviewed with and the answers agreed upon by the subject of the examination. This questioning is done while the examinee is attached to a very sensitive instrument which monitors the person's respiration, electrodermal response, and cardiovascular activity to determine if there are any significant and consistent changes in these areas in direct response to any of the questions. The objective is to ascertain that there are no such reactions which would indicate that at the time of the examination, the answers posed no problems nor stirred any anxiety. Should significant and consistent reactions occur to any one or more of the questions, this would be a definite indicator that the answer provided to the question as worded on the test was not considered completely satisfactory by the examinee.

Reactions are significant changes from the baseline recording which is established as the norm in each of the recorded areas at the beginning of each polygram or chart. Depending on the individual examinee, these changes may be as massive as a total cessation of breathing or a major increase in blood pressure or as subtle as a change in the inhalation - exhalation pattern of respiration or slight decrease in skin resistance. The point is that the reactions will occur specifically at the problem question and not randomly, they will be significant to the trained examiner, and they will be consistently occurring at the problem question whenever it is asked.

Upon completion of the test series, the examiner makes an initial evaluation of the charts. If the results indicate deception, the subject is told that, and the specific questions are discussed. The subject is given every opportunity to explain his specific reactions to these questions and to make any admission that he chooses. The information provided will be the basis of additional or modified test questions in those areas in an effort to resolve the issue.

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Just as there are several standardized intelligence tests and several standardized aptitude tests, there are also a number of standardized polygraph test formats. Each of these has its own name and format. Within the federal government, the commonly used techniques include Zone Comparison, Modified Reid Control Question Technique, Relevant-Irrelevant Technique, and Peak of Tension Technique. There are also standard variations of each of these. I am prepared to discuss these techniques in greater detail if the Committee so desires. First, however, I would like to show you a brief television tape of about three minutes that displays a portion of a polygraph test.

At NSA, at the conclusion of the examination and interview, the information provided by the examinee is reviewed with him by the examiner to ensure that it has been accurately noted by the examiner. When the examiner begins to prepare his report of the examination, he will again analyze the charts prior to making his final determination. The report of the examination, including the polygraph charts, the examiner's original notes, and the audio tape of the examination and review with the examinee, is reviewed by a supervisor senior examiner. This individual will do a separate analysis of the charts and then review the report with the tape to ensure accuracy. Once satisfied in these areas, the report is forwarded to our clearance division, a completely separate entity within the Office of Security, where the information will be evaluated to determine the individual's eligibility for access to sensitive compartmented information in accordance with the standards established by Director of Central Intelligence Directive 1/14 (DCID 1/14).

If the information provided is considered disqualifying and the individual is a military assignee, the sponsoring service is notified and usually takes appropriate action to reassign the person to other duties. If the information is not considered disqualifying but the assignee did not pass the polygraph examination, another exam will be scheduled with another examiner to attempt to resolve this matter.

This then, is the manner in which a "real world" polygraph examination is conducted and the quality control procedures work at NSA.

The validity of polygraph techniques has been the subject of research over a period of more than 85 years involving scientists in over a dozen nations. Lengthy research projects have been conducted in the United States, Japan, Israel, Canada, and a number of other nations. All of them arriving at rates of validity significantly above chance and high enough to indicate the positive value of the technique. There are two kinds of polygraph research. One involves the follow-up of real criminal cases in which the polygraph results are compared with either the final outcome of the case or an independent adjudication of the case file. More than 1900 criminal cases have been followed up in the United States, Israel, and Canada and the average agreement is above 96 percent. More than a dozen such projects have been conducted, with the largest being one by the Commonwealth of Virginia in which the validity of 959 cases was 98.3 percent. The range of all these studies is 86.3 percent to 100 percent. These statistical results, based on the follow-up of real cases, do not include those examinations in which the results were reported as inconclusive. It is the use of inconclusive range that gives the field examiner the opportunity to be fair and safe, and say, "I don't know."

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Inspector Doran, of the FBI, has spoken of the importance of this inconclusive range. He said, "The inconclusive range serves a purpose - it is the safety zone and should be protected to avoid unnecessary errors. No examiner should render a judgment if he/she is not completely comfortable with his/her findings."*

When research is conducted in a laboratory setting where truth and deception is known (except to the examiner), the validity of polygraph techniques average 93.6 percent, with a range of 69.0 percent to 100 percent. Not all of the laboratory projects were conducted to determine validity. Some were projects to evaluate variations in techniques, methods of analysis, specific and often single physiological recordings, and differences in subject populations. For example, the third study by Hec- kel was of institutionalized delusional psychotics, which produced a low validity, 69 percent; while the several studies of psychopaths have surprised us, with an average detection rate in excess of 90 percent. One observation about laboratory work is that when the experient is close to field conditions, using trained examiners and good polygraph instruments, the results are uniformly high. That polygraph techniques are cross-cultural is evidence from the similarity of the results of studies made in Israel, Iceland, Japan, Canada, India, and the United States.

Among the major techniques, there is little difference in their accuracy. The laboratory validity of control question formats average 95.2 percent, relevant-irrelevant format average 96.8 percent, peak of tension formats average 91.2 percent, and guilty-knowledge formats average 94.4 percent. Analysis of research projects on screening examinations produced an average of 96.7 percent. Since field examiners often use combinations of techniques, no average can describe the accuracy of examinations for individual cases. Moreover, these percentages are so close that the differences are insignificant. It must be noted that screening is not a specific format. There are several standard techniques which are used in criminal investigations which are also used in government screening. The research shows that when these formats are used in screening examinations, the errors are not evenly divided, but show a slight trend toward calling deceptive persons truthful.

There are five scientific studies that are directly related to the validity of screening (Barland, 1981; Blum and Osterloh, 1968; Correa and Adams, 1977; MacNitt, 1942; Hemsley, Heselgrave and Furedy, 1979). There are others which have a relationship to the issue of validity in personnel security, but the research was not conducted for that purpose (Edel and Jacoby, 1975; Lykken, 1960; Leiblich, Naftali, Shmueli and Kugelman, 1974).

The first scientific study of the validity of screening was conducted by Professor MacNitt of Wilmington College 1942. Working with the Columbus Ohio Merchants Audit Bureau, they set up an experiment where he would give polygraph screening tests to 59 employees of various stores. The Audit Bureau picked some employees whose honesty and integrity were considered above reproach, some employees who had confessed to stealing

*"Inspector William Y. Doran Addresses Federal Examiners." Polygraph 10(2)(June 1981): 61-62. Inspector Doran was Deputy Assistant Director, Laboratory Division, FBI.

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merchandise and money from their employers, and some employees who were known to have stolen goods but had not been confronted. All denied stealing during the tests. Using a relevant-irrelevant technique, MacNitt was able to correctly identify the guilty and the innocent employees in every case, for an accuracy of 100 percent. When he used supplemental searching peak of tension tests, he failed in getting a few details correct, as to the amount stolen, the year stealing started, and other specific details.

In 1968, Blum and Osterloh of Stanford University undertook a study in which real police informants were tested by police examiners, with regular polygraph instruments, using a relevant-irrelevant technique, as to the truthfulness of the informant's reports. Working with their police handlers, some informants gave completely true statements about what they had observed or heard, statements which were supported by investigations. Some informants gave partly true and partly false statements; and some gave totally false statements that were credible and compatible with their background. The informants were genuinely afraid to appear at police headquarters and be tested because of the consequences if discovered by their associates.

In screening these 20 informants, the examiners were able to identify whose stories were totally true, those whose stories were totally false, and those who told stories that were partly true and partly false. However, the examiners were not able in every case to correctly classify the individual items that were true or false, told by those informants who gave stories that were only partly true. Of seven subjects who told partly true stories, the examiners erred four times on the specific details of stories told by three of the informants. However, the examiners correctly identified 102 of 106 specific details of stories, for an accuracy of 96 percent; and were 100 percent correct in separating the truthful and lying informants.

In 1977 Correa and Adams, at the University of Georgia, simulated polygraph screening with 40 subjects. The tests consisted of three series of questions about information on a pre-employment data sheet. As in real screening, subjects who reacted to relevant questions were asked about these responses, and when appropriate, questions were rephrased and included in the next chart series.

The screening tests successfully identified all those who were completely truthful and all of those who were untruthful to one or more of the questions, for an accuracy of 100 percent. In regard to identifying the specific questions that subjects lied to, the accuracy was less than perfect. There were 180 specific lies told by the lying subjects with respect to items on their pre-employment data sheets. In addition, there were 60 control lies about a pre-employment interview, questions added as checks since some participants might not fully cooperate in truthfully answering questions on the pre-employment forms. One hundred and fifty (83 percent) of these questions were correctly identified as deceptive, and 30 (17 percent) were not. No truthful persons were called deceptive. The research had a secondary purpose, to decide if there was a difference in detectability of those with high motivation, a cash incentive, and those with low motivation. There was no difference in total detection of truthful and lying subjects, as that was 100 percent. There was a difference, in that the detection rate for specific lies was higher for

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motivated subjects, but the difference was not statistically significant. The technique was relevant-irrelevant, a technique which uses control questions.*

One of the theoretical questions raised about screening, and other applications of polygraph technique, is whether detection is above chance when the subject is not emotionally involved. Some laboratory evidence suggests that if the subject doesn't care, the detection rate might be reduced. Another question is whether they will be detected at all. Hemsly, Heslegrave and Furedy at the University of Toronto in 1979 tested two groups of ten each, in which one group gave misinformation on parts of their biographical forms but no particular issue was raised about this. The other group was entirely truthful in filling out forms, and in both groups the stimulus intensity was minimal. The question was whether the autonomic nervous system, as measured by skin conductance, would show greater activity for those who were untruthful than those who were truthful. The results showed the skin resistance responses were significantly greater for deceptive responses than truthful responses.** The authors concluded that skin conductance could, in the laboratory, detect pure, unemotional deception.

An Army Intelligence Study, subsequently analyzed by Dr. Barland, considered three difference ways to read screening charts. The screening of 40 subjects employed a control question technique.*** Three methods were used to evaluate the charts: A Zone Method, a Greatest Control Method, and a Relevant-Irrelevant Method. The first two used a numerical system comparing relevant and control question responses. The latter considered the size and consistency of responses to relevant questions without direct comparison with control question reactions. Omitting inconclusive results, the Zone Method identified 81 percent of the deceptive persons and 75 percent of the truthful. The Greatest Control Method identified 68 percent of the deceptive and 83 percent of the truthful. The Relevant-Irrelevant Method identified 86 percent of the deceptive persons and 76 percent of the truthful.

When responses were analyzed for individual questions (250 truthful, 80 deceptive), only the Relevant-Irrelevant Method identified deceptive responses at greater than chance, the range being 54 to 69 percent. All of the methods were better than chance at identifying truthful questions, the range being 91 to 97 percent. The value of this research was in the variations resulting from difference analytic approaches.

* All current relevant-irrelevant techniques use control questions, but are not classed as control question techniques because of a fundamental difference in evaluating the charts.

** $S + 2.28$ Umhos for deceptive, $x + 1.40$ Umhos for truthful. There was no habituation effect, nor was there a sex difference.

*** Although the polygraph technique used for this research is not widely used for screening, the comparison of analytic techniques would not have been possible without it.

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Another issue is to what extent can people be detected when they lie about personal details of their life, details they do not want to be detected. Is the act of deception of sufficient magnitude to be detected, as compared to the act of deception in denying a serious crime? In this experiment, there was an added complication, as the subjects were trained to confuse the examiner by producing false reactions. Dr. David Lykken of the University of Minnesota devised this experiment in 1960, in which 20 subjects were given practice in producing false electrodermal responses, with biofeedback reinforcement. Subsequently they were given a multiple choice-type test* in which correct biographical information was listed among five similar items of incorrect information. Only electrodermal recordings were made. The issue was whether the correct items could be detected from the incorrect items when the subject was actively trying to prevent that detection. There was a financial reward of ten dollars if they could defeat the test.

The personal information belonging to each subject was correctly identified by scoring the amplitude of electrodermal response in each of the 20 cases. The detection was 100 percent, despite the countermeasures.

Edel and Jacoby studied the consistency with which ten experienced polygraph examiners read charts from screening examinations conducted at a federal agency. The examiners were required to determine whether there was or was not a significant physiological reaction in each of the three physiological channels, respiration, electrodermal and cardiovascular, following each question. They looked at all the charts in 40 cases. Those charts involved 2530 questions. Thus the examiners, reading the charts blind, made 7590 decisions. The original examiners for each of the 40 cases were also asked to score their charts blind (and long after they were conducted). The agreement between the original examiners and other examiners was 96 percent. The average agreement between the blind raters was 94 percent.

Liebllich and other at the Hebrew University of Jerusalem explored the effect of repeated presentations to subjects, and the ability to detect the subject's first name from among five. There were 58 subjects. The series of five names were repeated ten times, altering the sequence each time. There was a ten second interval between presentation of names, and only an electrodermal recording was made. The experiment was complicated by having high and low motivation groups and a subgroup among the high motivation group that attempted countermeasures. Chance was 20 percent.

Cumulative scoring (common to most polygraph formats) increased the detection rates for the 28 in the low motivation group from 60 percent on the first series to 90 percent. The high motivation group detection rate improved from 55 percent to 93 percent. The high motivation group that attempted countermeasures improved from 60 percent to 100 percent. The overall average improvement of detection was from 57 percent on the first series to 94 percent with cumulative scoring.

I have described these research projects in some detail to discredit the notion that there has been no research to validate the use of

* Called a Guilty-Knowledge Test.

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polygraph techniques applied to personnel screening.

In regard to countermeasures, a well trained examiner will detect all of those common methods talked about on the street and published in popular books. Detecting and defeating countermeasures is part of our training in basic and advanced courses. Most of those so-called countermeasures do not even prevent the examiner from getting readable charts. Among the few that do, the subject's attempts are readily apparent.

Now it is obvious that truthful people do not engage in countermeasures where the test results are important to them. They want the examiner to succeed. The use and detection of those countermeasures which may prevent the examiner from getting charts that he can read is a sufficient basis for interrogation or further investigation. The practical consequences of detected countermeasures are the same as those test results indicating deception.

There is concern in the government about highly sophisticated countermeasures which may involve lengthy training of selected persons. DoD and other agencies are now involved in planning long term research projects in those areas.

In addition to the research described in the DoD Reprt, you should know that we have in DoD a number of research projects underway. There is a long term project, in its second year, developing a much improved instrument, including computer analysis of the physiological recordings. There are other projects looking at biofeedback as a means of enhancing polygraph techniques, and studies of countermeasures. There are several other research projects that will be sent out for bids soon. In addition, the National Security Agency and the Federal Bureau of Investigation are establishing a specially equipped joint research laboratory, staffed with psychophysicologists who are polygraph examiners. In addition to the two Ph.D. examiners, there will be a laboratory assistant, staff examiners and clerical support. They will conduct research on new equipment, the development of improved techniques for specific issue and screening applications, and other technique matters of mutual interest.

The utility of the polygraph was addressed earlier in my testimony and also will be evident from the 50 polygraph cases described in the report prepared by the DCI Security Committee.

In addition, the DoD Report on The Accuracy and Utility of Polygraph Testing gives more examples of the utility of polygraph testing. It describes cases where only the polygraph test gave us a lead into espionage cases; and it describes cases where innocent persons have been saved from trial, conviction, and even from jail because of polygraph tests. It describes how polygraph results compare with the results of background investigations, and the unique contributions made by both, plus the need for both methods, rather than one or the other. The report also compares the results obtained with interviewing without the polygraph, with the results obtained by interviewing supported by the polygraph. Last, the report describes all the major research conducted on polygraph validity, with a thorough analysis of the strengths, weaknesses and significance of that research.

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Let me conclude on the most important point. We in the security and CI business must evaluate any program, including the polygraph, on the basis of its effectiveness in detecting or deflecting espionage. We at NSA have been saved from major problems by this invaluable tool. Both the DOD/NSA Report and the Security Committee Report contain summaries of such cases. Some are not without ambiguity and I don't propose to recount all these cases here. Let me summarize just two cases from recent years:

. A military person about to retire from active duty where he had access to sensitive compartmented information applied for a job with NSA. He had a clean record. He reacted to polygraph questions about espionage. He was confronted with these reactions. He said that only days before he had visited the Soviet Embassy in Washington to make arrangements to defect. However, the Soviets suggested he complete his processing for sensitive employment.

. An applicant for employment at NSA reacted to espionage questions. He then admitted knowing and working with a foreign intelligence officer. He declined to give us details and he continued to react to the relevant counterintelligence questions.

This information could have been gained no other way - only our skilled polygraph examiners saved us from potential disaster.

I have every confidence in the polygraph as a valid technique and every confidence in the skill and integrity of my polygraph examiners.

If you have any questions, I will be happy to answer at this time.

* * * * *